

REMARKS

Applicant respectfully requests reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

Claims 1-7 are currently being amended.

Claims 13-15 are requested to be cancelled.

This amendment adds, changes and/or deletes claims in this application. A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier. After amending the claims as set forth above, claims 1-12 are now pending in this application.

In the office action of April 18, 2007, the Examiner rejected claims 1-15 under 35 U.S.C. §101 as being directed to non-statutory subject matter. The Examiner asserted that the claims are directed solely to software, which is *per se* not considered concrete as required by MPEP 2106. In response to the Examiner's comments, Applicant has amended claims 1-7 to more particularly describe the system and hardware components required for use of this invention and to clarify that the claims are directed to the system, including a computer program product embodied on a computer-readable medium, and not merely software. Applicants respectfully submit that the rejection has been overcome and the claims stand in condition for allowance. Regarding claims 8-12, Applicants note that the claims are directed to an "apparatus". The Examiner rejection has not made it clear how the claims directed to an apparatus having series of components is in fact software per-se. As such, Applicants respectfully request the rejection be withdrawn.

The Examiner also rejected claims 1-15 under 35 U.S.C. §102(b), asserting that the claims are anticipated by TOPCCIP's *Preliminary Research and Development Roadmap for Protecting and Assuring the Energy Infrastructure* ("the TOPCCIP reference"). Applicants disagree with the rejection of the patent submission based on this reference. Before turning to

the specific limitations of the claims that are not taught by the TOPCCIP reference, Applicants wish to stress that the TOPCCIP reference repeatedly indicates that a need exists for a system to identify infrastructure interdependencies. Also, one of the major problems with citing the TOPCCIP reference as anticipatory prior art is that there is a significant difference between the TOPCCIP reference's modeling computer program product entire approach to infrastructure as compared to the claimed invention. For example, the TOPCCIP reference teaches a system that is designed to analyze each infrastructure system separately (i.e. treating electric power separately from gas power), to model only energy systems, and to draw connections between them based only on limited simulations. In sharp contrast, the claimed invention is directed to a system that is designed to comprehensively model an entire subset of selected systems from the economy to electric power using a Complex Adaptive System ("CAS") (see paragraphs [0003] and [0004]) which can "evolve" to demonstrate outcomes that would otherwise remain unseen.

When the TOPCCIP reference makes clear the fact that the methods and processes required to achieve the broad goals described generally therein did not yet exist. In fact, the TOPCCIP reference states "[s]ignificant evidence shows that present models do not accurately predict power system behavior during stressed conditions," and "work needs to be done to develop more effective algorithms and methods for computing stability indices, particularly for increasingly complex systems" (page B-27 middle). The TOPCCIP reference in fact suggests a goal of the year 2010 (table B.6) for the creation of technology needed to model agents in a simulation.

Thus, the present claims provide a concrete, real solution to the problems identified in the TOPCCIP reference, while the latter provides merely a "wish-list" of issues that needed to be addressed. Rather than anticipate the claimed invention, the TOPCCIP reference serves to further highlight the long felt need for a solution to the problems noted therein and solved by the specific system taught by the present application.

Turning to the specific limitations of the claims, the TOPCCIP reference fails to teach "[s]electing from a set of infrastructure systems a subset comprising a plurality of interdependent

infrastructure systems;” as claimed in the currently amended claim 1. The present application and the claims specifically require that the system is acting on more than one infrastructure. One of ordinary skill in the art would appreciate, particularly in light of the Applicants usage of the term (paragraphs [0003] and [0004] among others), that infrastructure as used in the claims refers to a single infrastructure such as the electrical distribution grid or the interstate natural gas pipeline system or a local distribution system for electricity. Such systems are referred to in the art as infrastructures and considered infrastructures in their own right. The TOPCCIP reference is consistent with this usage and treats (see, for example, the image on the front cover depicting various individual infrastructures). The Examiner has merely cited to lists of infrastructures contained in the TOPCCIP reference. For example, the citation to page 18 of Tab B of the TOPCCIP reference is misplaced, as it is clear from both the heading and the context that the infrastructure being referred to is the national energy grid. The reference to interconnection of the power system does not refer to the interconnection of different infrastructures (such as the electric grid and interstate gas pipelines) but rather to the interconnection of different individual utility companies acting as either transmission entity (i.e. from power plant to substation) or as a distribution entity (from substation to end user). At the time the TOPCCIP reference was created, the national electric grid was in the process of truly becoming a national grid with the subsequent formation of regional transmission organizations (RTOs) such as the PJM Interconnect in the Midwest. However, this is clearly not the interconnection of different infrastructures but rather the integration of various systems within the same infrastructure (in this case the national electric grid). As such, the TOPCCIP reference fails to teach the selection of a subset of infrastructures from the larger universe of substructures allowing for the comparison of the interdependencies between different infrastructures as opposed to the system alluded to in the TOPCCIP reference that would allow for analysis of the intradependency of systems within the same infrastructure.

In addition, the claims require “equivalencing the subset.” Once again, the TOPCCIP reference fails to teach this limitation. As discussed above, the TOPCCIP reference does not teach the use of a subset of infrastructures but rather looks within a single infrastructure and thus

no subset exists. Furthermore, the cited portion of Tab B (page 48) is referring to the calibrating of a theoretical model to the actual electrical power system. This is not equivalencing a subset of infrastructures, it is making sure that a model of an individual distribution or transmission companies system (a part of a larger single infrastructure) is accurate. While the TOPCCIP reference does include the term “equivalencing”, it in fact states “[r]esearch on network equivalencing is also needed.” Applicants fail to see how such a clear assertion that something is not known in the art can be the basis for a rejection.

Claim 1 further requires “creating a plurality of agents to interact with the subset,” which is also not taught in the TOPCCIP reference. As already discussed, the TOPCCIP reference is related to the analysis of intradependencies within a single infrastructure. No subset representing a plurality of infrastructures is taught and thus no agents are described as interacting with such a subset. At best the TOPCCIP reference teaches that it would be desirable to have some form of automation within an infrastructure (not between infrastructures). The teachings of the cited page 23 and the preceding page 22 make it clear that the TOPCCIP reference is referring to a reasoning element for handling a single infrastructure.

Finally, Claim 1 requires “simulating multi-scale agent interactions.” Again, for at least the reasons discussed above, the failure of the TOPCCIP reference to contemplate interdependencies between infrastructures means one of ordinary skill in the art would appreciate that the simulating of multi-scale agent interactions in regard to multiple infrastructures would not be possible.

For at least the above reasons, the rejection of the claims should be withdrawn and Applicants request allowance of the claims.

In light of the above, Applicant submits that the prior art fails to teach any of the claimed limitations. Regarding the dependent claims, the TOPCCIP reference likewise fails to provide any of the limitations as it does not teach interdependency. For example, the geographic references in the TOPCCIP reference are within a single infrastructure (claim 2).

The only references that refer to concurrent time in the TOPCCIP reference refer to communication and information-sharing initiative occurring “in real time,” again within a single infrastructure (claim 3). The reference cited by the Examiner as precluding claim 4 “selecting a plurality of infrastructures to simulate; and connecting the infrastructures, including the steps of screening candidate interconnections” merely mentions that “fault scenario screening tools are candidates for research initiatives” (B-49), and, if the connection is not tenuous enough, the latter is suggested for a single infrastructure. The second part of claim 4, “assigning candidates a likelihood of connection,” is not even suggested in the TOPCCIP report. The Examiner cites the section describing the threats facing energy systems, “energy companies can minimize the impacts of highly unlikely events, such as multiple simultaneous equipment failures at a single site” (B-11 top). This refers only to connections within a single infrastructure, here the energy system, not to connections between infrastructures.

The TOPCCIP reference refers to identifying connections outside of the subset only in terms of identifying connections within one infrastructure, and only that cryptically, discussing the need to create a national energy infrastructure (B-3 middle) and the need to develop a comprehensive picture of the gas pipeline transmission network (B-54) (claim 5). The TOPCCIP reference refers to creation of agents as a modeling tool, but only by the following: “It may be advisable to investigate agent-based computational methods” (B-50 top), and table B.6 sets a goal of the year 2010 for the development of autonomous agents. Again, these vague objectives are mentioned in reference merely to gaining a better understanding of a single infrastructure.

The references that the Examiner asserts disclose claim 7 refer to the existing control centers of the electric power grid (B-5), of one infrastructure only, not to a model of multiple infrastructures. The TOPCCIP report also refers to a goal of developing faster control so that a given infrastructure system can react “rapidly enough to maintain stability under contingencies conditions” (B-47), not to an existing product that will model whole subsets of infrastructure systems “until a steady state is achieved” (claim 7).

Since claims 9-12 were rejected under the same prior art teachings and with no further explanation, Applicant submits that the above remarks also serve to clarify the scope of claims 9-12.

As such, Applicant submits that all of the claims rejected based the aforementioned reports are patentable over these references.

Applicants note that the examiner has not made any other rejection based on the prior art besides that over the TOPCCIP reference. The Examiner's statement that additional rejections would have been cumulative is understood to indicate that any such rejections will be viewed to stand or fall with the TOPCCIP rejection, as otherwise they would not be cumulative and should have been presented in this office action to prevent a piecemeal examination of the claims.

Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

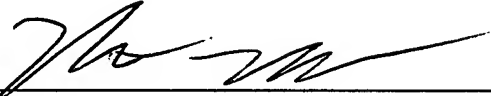
The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check or credit card payment form being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

Date

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By



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